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BY

WILLIAM E. DUELLMAN

UNIVERSITY OF KANSAS  
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# A New Species of Fringe-limbed Tree Frog

## Genus *Hyla*, from Darién, Panamá

BY

WILLIAM E. DUELLMAN

Exploration in the mountainous areas of Darién Province in eastern Panamá has revealed the presence of several previously unknown amphibians. One of the most unusual species found to date is a large fringe-limbed tree frog, which, like other fringe-limbed species, has large hands and fully webbed feet. In allusion to the fringelike dermal folds on the limbs, I propose that the new species be named

### *Hyla thysanota* new species

*Holotype*.—United States National Museum No. 151080 from Cerro Malí, Darién Province, Panamá (elevation 1265 meters), obtained by Dr. Charles O. Handley, Jr., on February 11, 1964.

*Diagnosis*.—Size large (95.7 mm. snout-vent length); dermal fringe on outer edge of forearm and outer edge of tarsus; skin of head and dorsum granular and uniformly green.

*Description of holotype*.—Adult female containing ovarian eggs and having snout-vent length of 95.7 mm.; tibia length 51.0 mm., 52 per cent of snout-vent length; foot length (measured from proximal edge of inner metatarsal tubercle to tip of longest toe) 44.6 mm., 46 per cent of snout-vent length; head length 31.1 mm., 32 per cent of snout-vent length; greatest width of head just anterior to angle of jaws 36.5 mm., 36 per cent of snout-vent length; snout, in lateral profile, rounded, in dorsal profile, broadly rounded; canthus heavy, rounded; loreal region deeply concave; lips broad, flaring. Nostrils protuberant laterally; internarial distance 7.0 mm., 19 per cent of head width; head flat above; interorbital distance 12.0 mm., 33 per cent of head width; width of eyelid 8.1 mm., 22 per cent of head width; diameter of eye 8.3 mm.; pupil horizontally ovoid, palpebrum unmarked; diameter of tympanum 4.8 mm., 58 per cent of eye, situated directly posterior to eye, separated from eye by 4.9 mm.; upper edge of tympanum covered by dermal fold extending posteriorly from eye to point above insertion of arm.

Upper arm short, slender; forearm only slightly robust; two transverse folds on wrist; thin, scalloped dermal fringe along outer edge of forearm from elbow to disc of fourth toe; hand large, 32.0 mm. from proximal edge of prepollex to tip of longest toe; length of fingers from shortest to longest, 1-2-4-3, fourth only slightly longer than second; fingers webbed to bases of discs, except web between first and second fingers extending only to bases of penultimate phalanges; discs large, all except that on first finger larger than tympanum; distal subarticular tubercle flat, others conical; supernumerary tubercles small, conical, present only on proximal segments, especially numerous on base of fourth

finger and on thumb, larger and fewer on second finger; prepollex elongate, flat, broadly visible from above, supported by flat bony spine; numerous small conical tubercles on ventral surface of prepollex and palm (Fig. 1a); heels overlap by about one-third length of tibia when hind limbs adpressed; tibio-tarsal articulation extending to eye; distinct dermal folds on knees and heels; thin tarsal fold curving from heel to inner metatarsal tubercle; thin, scalloped dermal fringe along outer edge of foot from heel to disc of fifth toe; inner metatarsal tubercle flat, broadly elliptical, visible from above; outer metatarsal tubercle absent; length of toes from shortest to longest, 1-2-5-3-4; toes fully webbed; discs smaller than on fingers; subarticular tubercles conical; supernumerary tubercles small, conical, in one row on each proximal segment (Fig. 1b).

Anal opening directed posteriorly at level of middle of thighs; anal sheath short, granular; distinct granular dermal fold on each side of anus. Skin on top of head and body finely granular (perhaps containing osteoderms); skin on belly and median posteroventral surfaces of thighs granular; other surfaces smooth. Tongue broadly cordiform, shallowly notched posteriorly, barely free behind. Vomerine ridges transverse, narrowly separated medially, situated between round choanae; vomerine teeth, 10-11; premaxillary teeth, 15-16; maxillary teeth, 73-71; all teeth strongly spatulate and bifid.

Color (*in alcohol*): dark purplish brown on dorsal surfaces of head, body, limbs, outer three fingers, and outer two toes; lower flanks, anterior and posterior surfaces of thighs, and ventral surfaces of hind limbs pale brown; webs dark brown; belly creamy yellow with brown spots anteriorly; chin brown; upper lip grayish white. Color (*in life*, according to collector's field notes): dorsum green; ventral surfaces pinkish white; eyes brown.

Skull (skin peeled back from head permitting superficial examination of skull) broader than long; having only moderate amount of ossification—no well-developed maxillary flanges (*pars facialis*) nor supraorbital processes; alary processes of premaxillary high; internasal septum cartilaginous; nasals slender, separated, long axes parallel to maxillaries, anterior ends not extending beyond sphenethmoid, not forming complete bony anterior margin to orbit; sphenethmoid large, bony in entire interorbital distance, anterolateral margins attached to nasals, posterior margin overlain by frontoparietals, extending posteriorly three-quarters length of orbit; frontoparietals slender, converging medially posterior to frontoparietal fontanelle, having cartilaginous flange over posterior part of orbit; frontoparietal fontanelle ovoid, about thrice as long as wide; quadratojugal robust; squamosal having extremely short anterior arm, moderately long posterior arm, well-developed ventral arm; prevomers large, forming anterior, but not posterior, margins of choanae; palatines well developed, toothless, extending medially to sphenethmoid, lacking prepalatine processes.

*Discussion.*—*Hyla thysanota* is another species in that group of bizarre hylids usually referred to as the fringe-limbed tree frogs. In size it approaches *Hyla immensa* Taylor from Costa Rica and *H. phantasmagoria* Dunn from Colombia, but both of these species have tuberculate skin on the dorsum, shorter and more blunt snouts, relatively larger tympani, and mottled brown dorsal coloration.

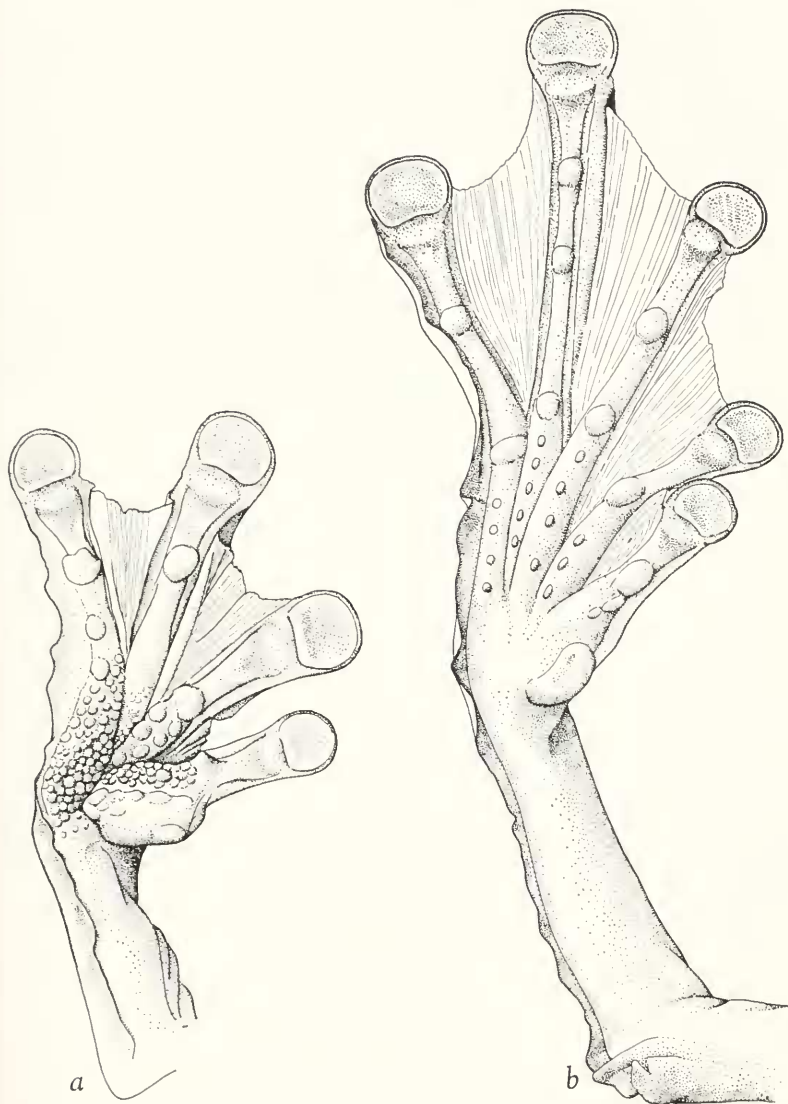


FIG. 1. Ventral views of right hand (a) and right foot (b) of holotype of *Hyla thysanota* (USNM 151080).  $\times 2$ .

*Hyla miliaria* Cope from Nicaragua, *H. richardtaylori* Taylor and *H. fimbrimembra* Taylor from Costa Rica are smaller species having less webbing, more scalloped dermal fringes, and brown dorsal coloration. *Hyla valancifer* Firschein and Smith and *H. echinata* Duellman from México have smooth skin on the dorsum, narrower fringes on the limbs, and brown dorsal coloration. The uniformly green dorsum of *H. thysanota* is unique among the fringe-limbed hylids.

Present knowledge of the fringe-limbed hylids, of which there are nearly as many names as known specimens, is insufficient to account for relationships. Perhaps the several species are members of two or more phyletic lines. It is noteworthy that the sizes and relationship of the cranial roofing bones of *Hyla thysanota* closely resemble those in *Hyla maxima*.

The type was shot from a tree-top at night, after its eye-shine was observed. The specimen was found in humid montane forest near the headwaters of the Río Pucro (Pacific drainage via the Río Tuira) on the east slope of Cerro Malí, which lies south of Cerro Tacarcuna in the Serranía del Darién.

*Acknowledgments.*—In January of 1964 I was in Panamá and planned to accompany Dr. Handley to Cerro Malí. Political events delayed our departure and I had to return to the United States. Dr. Handley generously took time from his collecting of mammals to secure amphibians and reptiles. I am grateful to him for his efforts and to James A. Peters for the loan of the specimens from the United States National Museum. I am indebted to Linda Trueb for the delineation of the hands and feet reproduced here as Figure 1. This paper is one result of the author's studies on Middle American hylid frogs supported by a grant from the National Science Foundation (NSF GB-1441) and a part of a survey of the herpetofauna of Panamá supported by a grant from the National Institutes of Health (NIH GB-12020).

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